USDA

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Luna Restoration Project

Proposed Action

Forest Service

Apache National Forest (Administered by Gila National Forest)
Quemado Ranger District May 2016

Cover Photo: Photo from the northern portion of Luna planning area. View looking east and south of Spur Lake Basin taken from a point near Bill Knight Gap. To the left is Freeman and Dillon Mountains and to the right is Bishop Mountain. The ranch in the middle is part of the Spur Lake Cattle Company called Gribble Head Quarters.

Contents

List of Figures

List of Tables

LUNA RESTORATION PROJECT

Introduction

The Luna Restoration Project is located along the western portion of the Quemado Ranger District around the community of Luna (Figure 1). The 185,586 acre Luna planning area is part of the larger Escudilla Landscape, a 279,470 acre landscape planning area that extends across both the Apache-Sitgreaves and Gila National Forests. The two forests are coordinating and have identified a number of treatments that will cross between the two forest boundaries. These treatments include: vegetation, watershed, recreation, prescribed fire, and wildlife.

Over the past year the Quemado Ranger District has reached out to the public; state, county, and federal agencies; and other interested stakeholders, inviting all to assist with the development of the proposed action and planning area. Stakeholders identified areas of concern related to wildfire potential and community protection; locations for ATV trails; road, trail, and sediment control features/structures maintenance needs; locations of vegetation restoration treatments, and locations and type of range improvements.

Background

The community of Luna is located in the southern portion of the planning area. Luna and surrounding private inholdings were identified as “high” on the priority list for protection from wildfires in both the 2001 Catron County and 2006 Luna Community Wildfire Protection Plans. In the early 2000s, hazardous fuels projects were implemented around Luna which included prescribed burning, thinning of ponderosa pine stands, and construction of a 300-foot fuelbreak on the south and west sides of the community.

Important infrastructure is located in the vicinity of Luna. A large electronic site is situated on the San Francisco Divide, located on the southern boundary of the project area. This site supports systems for the Forest Service; Catron County Sheriff’s Department and Emergency Management Services; New Mexico State Police; and other electronic facilities for private enterprises. Also, two Tucson Electric Power interstate transmission lines extend through the entire length of the project area. The El Paso Electric interstate transmission line runs approximately 3 miles northeast of the planning area. A local service line managed by Navopache Electric Power Company extends in and around Luna.

The community of Luna and key infrastructure are located in a forested, ponderosa pine setting and on mountain tops. Prevailing winds, alignment of topography, and dense forest vegetation place the community and infrastructure at risk to a wildfire starting in the southwest corner of the project area and rapidly burning northeast. To reduce this hazard and provide firefighters a safer environment to take fire suppression actions, a variety of vegetation treatments and prescribed burning activities are being proposed. These treatments are being strategically placed south and west of Luna.

In 2011, the Wallow Fire burned onto the Gila National Forest from Arizona, west of the community of Luna, burning approximately 15,400 acres in New Mexico. The fire burned across the landscape with varying levels of severity. High severity fire impacted numerous natural resources. Immediately post fire flooding occurred, and numerous sediment trap and tanks across the fire area were silted in.

Within the larger Escudilla Landscape area (both Arizona and New Mexico), 39,385 acres were burned, with post-fire satellite imagery indicating 1,757 acres were severely burned and 4,039 were moderately burned. The impacts of the Wallow Fire have resulted in degraded watershed conditions on thousands of acres; substantially altering future yields of clean water. Future vegetative communities; thus land use opportunities especially on the heavily impacted areas, will continually change as the severely degraded areas move through successional stages of recovery and various vegetative communities develop.

The Wallow fire and post-fire impacts on the landscape, watersheds, habitat, forest facilities, infrastructure, and community of Luna highlights the potential impacts and issues the forest, community members, and private land owners could face again.

Existing Condition

Vegetation and Fuels

The Luna Restoration Project area contains a wide range of vegetation communities including grassland, shrubland, woodland (pinyon pine, juniper), riparian, and forest (ponderosa pine and mixed conifer). The vegetated areas and stands are departed relative to desired or historical densities. There is an imbalance in the composition and species dominance, vegetation densities, and structure in these vegetation communities (Table 1).

Table 1. Summary of vegetation communities and percent departed from desired conditions. Higher percentage the greater departure from desired.

Vegetation Communities	Percent Departure
Grassland	65%
Shrubland	15%
Woodland	25%
Forest Ponderosa Pine	60%
Forest Mixed Conifer	60%
Riparian	35%

Vegetation departure is resulting in competition for moisture, sun light, and nutrients, leading to stressed / unhealthy trees that are prone to insect damage, disease, and wildfire. Trees intercept moisture and sunlight before it reaches the ground, reducing diversity, quantity of understory vegetation, and the acres of grasslands and meadows. Ponderosa pine and mixed conifer stands are a dense thicket of trees generating a thick layer of needle litter and duff in places.

Modeling results suggest current vegetative conditions in the planning area could result in torching/passive and active crown fires that are uncharacteristically intense and severe (Table 2; Figure 2). The average fuel conditions across the planning area show that there are dense stands, closed canopies, ladder fuels (canopy base height), and surface fuel loadings (Table 3).

Table 2. Acres by fire type within the Luna Planning area.

Fire Type	Description	Acres at Risk
Surface Fire	Fire that burns predominately across the surface litter and undergrowth	44,183
Torching/Passive Crown Fire	Type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods	86,842
Active Crown Fire	Also referred to as running crown fire or continuous crown fire. An active crown fire presents a solid wall of flame from the surface through the canopy fuel layers	36,566

Table 3. Existing fuel conditions by vegetation type within Luna planning area.

Vegetation Type	Surface fuel loading[1] (tons per acre)	Coarse Woody Debris[2] (tons per acre)	Canopy Base Height[3] (feet)	Canopy Bulk Density[4] (kg/m3)
Pinyon juniper	5	4	5	0.08
Ponderosa pine	5	3	11	0.07
Mixed conifer	11-18	7-13	4-7	0.11-0.14

[1]Surface fuels include the total amount of fuels on the forest floor. Surface fuels include duff, grass, needles, sticks, and small branch wood. Surface fuel loads are measured in tons/acre.

[2]Course woody debris consists of fallen dead trees and the remains of large branches on the ground in forests and woodlands. Course woody debris is measured in tons/acre.

[3]Canopy base height is the average height from the ground surface to a forest stand's canopy bottom.

[4]Canopy bulk density is the mass of the available canopy fuel. Canopy bulk density is used to predict crown fire.

Watershed and Aquatics

All or portions of nine 6th Code Watersheds are in the Luna Planning Area (Table 4). In 2015 watershed condition ratings were determined by a qualitative assessment of twelve indicators. These indicators include water quality, water quantity, aquatic habitat, aquatic biota, riparian/wetland vegetation, roads/trails, soils, fire regime/wildfire, forest cover, rangeland vegetation, terrestrial invasive species, and forest health. The indicators were given a rating of Functioning Properly, Functioning at Risk or Impaired. A composite score was derived from these ratings to give an overall watershed condition rating. Watersheds that are rated in Class 2 or Class 3 condition have several indicators that are not Functioning Properly. Examples of this include poor road drainage, high erosion rates, degraded riparian conditions, fragmented aquatic habitat, recent high severity wildfire, noxious weed infestation, decline in perennial water, and road/stream conflicts.

Aquatic and riparian obligate species are being impacted by impaired watersheds. High sediment loads and temperatures, lack of woody debris in the channel, lack of mature, multi-story riparian vegetation, and exotic species are some of the conditions present.

Table 4. 6th Code Watersheds in the Luna Planning Area. Summary of the 2015 Watershed Condition Rating and number of streams in non-attainment of New Mexico State Water Quality Standards.

6th Code Watershed	2015 Watershed Condition Rating(*)	# of Streams/Stream Name in Non-Attainment of State Water Quality Standards (**)
Trout Creek	Class 2	0
Stone Creek-San Francisco River	Class 2	1/San Francisco River
SA Creek	Class 2	0
Outlet Centerfire Creek	Class 3	1/Centerfire Creek
Big Canyon-San Francisco River	Class 2	1/San Francisco River
Headwaters Centerfire Creek	Class 2	1/Centerfire Creek
Spur Draw	Class 2	0
Dry Blue Creek	Class 2	0
Canovas Creek-Coyote Creek	Class 2	0

(*)Class I = Functioning Properly; Class 2 = Functioning at Risk; Class 3 = Impaired Function

(**)2016-2018 State of New Mexico CWA § 303(d)/305(b) Integrated List and Report: San Francisco River listed for exceedances of benthic-macroinvertebrate bioassessments, water temperature, Escherichia coli and turbidity; Centerfire Creek listed for exceedances of Escherichia coli, nutrient/eutrophication biological indicators, sedimentation/siltation, specific conductance, water temperature, and turbidity.

Note: The nine watersheds listed make up the majority of the project area. Several other watersheds are impacted by the project, however less than 5% of the project area is within each of these watersheds.

Wildlife

The Luna Planning Area is located in the Upper Gila Mountain Recovery Unit for the Mexican Spotted Owl (MSO). On the Gila National Forest, the MSO occupies mixed conifer and ponderosa pine/Gambel oak vegetation types, usually characterized by high canopy closure, high stem density, multi-layered canopies within the stand, numerous snags, and downed woody material.

One of the primary concerns for the MSO is the potential loss of habitat from uncharacteristic wildfire (USDI 2012). Crown fire potential was analyzed, approximately 68% of the planning area is at risk to torching/passive and active crown fire.

The habitat outside of MSO protected activity centers is managed for Northern Goshawk habitat. Portions of the Northern Goshawk Post-Fledging Areas is characterized as having dense, small-diameter, young ponderosa pine trees. These stands are also at risk to torching/passive and active crown fire.

Browse for big game species across the planning area is decadent with little regeneration to provide forage for wildlife.

Desired Condition

Vegetation and Fuels

The desired condition are:

- Maintain and restore vegetative communities that are departed from desired condition (Table 1)
- Reduce the number of acres at risk to crown fires (Table 2)
- Use wildland fire as a disturbance agent
- Have the mean fire return intervals ranging from 2-24 years in ponderosa pine and dry mixed conifer stands
- Move the planning area fuel conditions towards values or ranges described in Table 5

Table 5. Desired fuel conditions by vegetation type within Luna planning area.

Vegetation Type	Surface fuel loading[1] (tons per acre)	Coarse Woody Debris[2] (tons per acre)	Canopy Base Height[3] (feet)	Canopy Bulk Density[4] (kg/m3)
Pinyon juniper	5	5-10	4-6	<0.05
Ponderosa pine	7-14	5-7	>18	<0.05
Mixed conifer	2-4	10-15	>5-10	<0.08

[1]Surface fuels include the total amount of fuels on the forest floor. Surface fuels include duff, grass, needles, sticks, and small branch wood. Surface fuel loads are measured in tons/acre.

[2]Course woody debris consists of fallen dead trees and the remains of large branches on the ground in forests and woodlands. Course woody debris is measured in tons/acre.

[3]Canopy base height is the average height from the ground surface to a forest stand's canopy bottom.

[4]Canopy bulk density is the mass of the available canopy fuel. Canopy bulk density is used to predict crown fire.

Watershed and Aquatics

The desired conditions are:

- 6th code watersheds are properly functioning and meet New Mexico state water quality standards (Table 6)
- A healthy, diverse riparian corridor that supports aquatic species and riparian obligates

Wildlife

The desired conditions are:

- Having a range of diverse habitats for fish and wildlife population
- Improve habitat for threatened or endangered species
- Reduce the risk of high severity fire within MSO acres identified for treatment
- Increase diversity in age, size, and structure of stands within Northern Goshawk habitat
- Increase diversity, productivity, and abundance of browse species (e.g. mountain mahogany, Gambel oak) for wildlife game species

Table 6. Desired conditions for 6th Code Watersheds in the Luna Planning Area. Summary of the 2015 Watershed Condition Rating and number of streams in non-attainment of New Mexico State Water Quality Standards.

6th Code Watershed	2015 Watershed Condition Rating(*)	# of Streams/Stream Name in Non-Attainment of State Water Quality Standards (**)
Trout Creek	Class 1	0
Stone Creek-San Francisco River	Class 1	0
SA Creek	Class 1	0
Outlet Centerfire Creek	Class 1	0
Big Canyon-San Francisco River	Class 1	0
Headwaters Centerfire Creek	Class 1	0
Spur Draw	Class 1	0
Dry Blue Creek	Class 1	0
Canovas Creek-Coyote Creek	Class 1	0

(*)Class I = Functioning Properly; Class 2 = Functioning at Risk; Class 3 = Impaired Function

(**)2016-2018 State of New Mexico CWA § 303(d)/305(b) Integrated List and Report: San Francisco River listed for exceedances of benthic-macroinvertebrate bioassessments, water temperature, Escherichia coli and turbidity; Centerfire Creek listed for exceedances of Escherichia coli, nutrient/eutrophication biological indicators, sedimentation/siltation, specific conductance, water temperature, and turbidity.

Purpose and Need for Action

The purpose of the Luna Restoration Project is to create and maintain a healthy resilient landscape and watersheds capable of delivering benefits to the public including clean air and water, habitat for native fish and wildlife, forest products, and outdoor recreation opportunities. There is a need to:

- Reduce the impacts of high severity fire on natural and cultural resources, private inholdings, communities, infrastructure, and livelihoods within the planning area
- Implement vegetative treatments to restore departed landscapes that are overstocked, encroached, and at risk to fire, disease, insects, and other climate stressors
- Implement treatments in watersheds that are not properly functioning
- Improve water quality by hardening stream crossings and performing road maintenance
- Continue to provide the wide range of forest products that are important to the culture, tradition and livelihoods of local communities
- Protect and restore threatened and endangered species and habitat
- Provide opportunities for OHV use, enjoyment, and access from the community of Luna
- Provide permanent water to support wildlife and livestock
- Improve rangeland, wildlife, aquatic and riparian habitat

There is a need to amend the Gila National Forest Plan (Forest Plan, as amended, 1986) for this project. These will be “project level” plan amendments, which are specific to and only applicable to the Luna Restoration Project. Project amendments are in the areas of:

- Wildlife habitat developments, prescribed fire, and activity fuels in Management Areas 3B, 3C, and 3D, to allow for restoration treatments over a greater amount of acres over time; and

- Mexican spotted owl to implement 2012 MSO Recovery Plan guidelines for threshold conditions recovery habitat.

Proposed Action

Vegetation Treatments

Woodland and Forest – Maintenance and Restoration (Figure 3)

Woodland (e.g. pinyon juniper, pinyon pine) and forest (ponderosa pine and mixed conifer) maintenance and restoration treatments are proposed on approximately 73,446 acres. Cutting of vegetation will be accomplished by hand or mechanized equipment. In forested systems activities would include thinning and group selections (e.g. creating 1-4 acre openings to encourage regeneration of trees).

Grassland – Maintenance and Restoration (Figure 4)

Grassland maintenance and restoration treatments are proposed on approximately 23,373 acres. Ponderosa pine and pinyon juniper have encroached, become established, and continue to spread into the grasslands. Proposed activities consist of cutting ponderosa pine and pinyon-juniper by hand or mechanized equipment, to reduce tree canopy cover to less than 10% in grasslands. Summary of treatment types and acres:

- **Grassland Tree Removal/Cutting** – approximately 20,581 acres
- **Grassland Meadow treatments** – approximately 2,792 acres
    - Treatments located in upland wet meadows and valley bottoms primarily associated with Jenkins Creek, Badger Creek, Romero Creek, Stone Creek, Dry Blue, San Francisco River, Dillman Creek, and Trout Creek areas

Rabbit brush treatment consists of mowing with rubber tired equipment during the dormant season (late fall to early winter) on approximately 100 acres for consecutive years to improve rangeland condition on the Centerfire Allotment. An additional 100 to 1,000 acres may be treated depending on monitoring results of the initial 100 acres (Figure 4).

Mexican Spotted Owl Protected Activity Centers

Thin small diameter trees <9 inches, pile burn or broadcast burn approximately 1,464 acres within protected activity centers. No activities would take place between March 1 to August 31 to avoid disturbance during breeding season.

Wildlife Habitat

Cut and prescribe burn Gambel oak and mountain mahogany stands to promote new growth and sprouting in various locations across the planning area. This would occur in conjunction with other vegetation and fuel treatments.

Wallow Fire Site Prep

Fall snags over approximately 1,955 acres within the Wallow Fire (2011) for site preparation (planting or natural regeneration of trees). Snags would be cut by hand or by mechanical equipment and piled, decked, removed and/or left where felled. Decks may be burned.

Fuels Treatments (Figure 5)

- Use prescribe fire exclusively to treat approximately 12,898 acres to maintain and/or reduce fuel loadings
- Use prescribe fire in areas identified for vegetation treatments (approximately 70,000 to 100,000 acres). Prescribed fire can be implemented prior and after proposed vegetation treatments
- Areas identified for prescribed fire are available for re-entry if objectives are not fully achieved as a result of initial treatments or for maintenance

Stream and Riparian Restoration (Figure 6)

Riparian Restoration

- Restore alder and willow vegetation in Stone Creek. Initially construct a 0.5 acre riparian exclosure. Once species are established, relocate or extend exclosure to continue riparian restoration.
- Construct elk exclosure along Centerfire Creek in area known as Pinpoint 40 to improve riparian woody survival.
- Conduct riparian planting and bank stabilization to improve water temperatures water quality in Centerfire Creek. This includes the area known as Pinpoint 40 and perennial headwater reaches.
- Conduct riparian planting in Spur Draw.
- Construct 3.25 miles of exclosure fence along Pace Creek to protect riparian and stream habitat for aquatic and riparian obligate species, including threatened and endangered species.
- Remove of bull thistle and other invasive plant species from the Dry Blue drainage (approximately 4 acres) by hand.

Stream Restoration

- Restore channel gradient and reduce sediment input to Dry Blue by installing a series of small rock weirs in Pace Creek. Weirs will be placed along a mile of the Pace Creek drainage.
- Improve stream crossings and road drainage features in Head of the Ditch Campground and the Trout Creek camping area to minimize sediment inputs to the stream channels
- Reconstruction of Luna Ditch diversion at the Head of the Ditch campground on the San Francisco River to provide for aquatic organism passage and year-long flow.
- Install grade control or stream stabilization structure(s) in Centerfire Creek near Pinpoint 40; Spur Lake Basin above Centerfire Bog; and Stone Creek in coordination with Apache-Sitgreaves National Forests

Sediment Control

- Perform maintenance and sediment removal on 157 existing sediment control structures found throughout the planning area

- Construct numerous new sediment control structures in the planning area, including but not limited to Spur Lake Basin, Jenkins Creek, Canovas Creek
- Seed severely degraded areas of the Spur Draw watershed to improve watershed condition, reduce sediment loss, and restore vegetative ground cover.
- Improve watershed condition and restore vegetative ground cover in Spur Draw drainage by constructing a livestock and/or elk exclosure

Range Management (Figure 7)

Add new or upgrade existing water systems on the Luna, Centerfire, and Mangitas allotments to increase livestock and wildlife distribution to benefit rangeland conditions, including watershed, soils, and stream resources (Table 7).

Table 7. Proposed water system project name and activities by allotment

Allotment	Project Name	Activities
Centerfire	S.A.	Bury 0.75 miles of pipeline.
Centerfire	Centerfire	Install 1 new well, 1 storage tank, and 1 drinker.
Centerfire	Freeman	Install 1 new well, 1 storage tank, and 1 drinker.
Luna	Hy Clark	Install 1 storage tank, 2 drinkers and 1.25 miles of pipeline. Possibly install 1 new well in section 12.
Luna	Sawmill, Kiehne & Adair	Install 1 new well, 2 storage tanks, 4 drinkers, and 2.75 miles of pipeline.
Luna	Stone Creek	Install 1 new well, 1 storage tank, 2 drinkers, and 0.75 miles of pipe.
Luna	Dry Blue	Install 1 new well, 1 storage tank, 4 drinkers, and 2.5 miles of pipeline.
Mangitas	Jones	Install 1 new well, 1 storage tank, 2 drinkers, and 0.5 miles of pipeline.

Motorized Transportation System (Figure 8, 8a-8e)

The proposed action includes:

- Conduct heavy maintenance on approximately 50 miles of Level 2 roads to improve drainage features and improve water quality.
- Assist Catron County in upgrading County Road B-012 road crossing of Spur Draw to facilitate adequate water passage, restore wetland function, and reduce ongoing erosion.
- Relocate and harden Forest Road 882 crossing on the San Francisco River at the Head of the Ditch Campground to provide safe ingress/egress for public and land owners, improve aquatic habitat and water quality

- Harden four motorized stream crossings on Dry Blue Trail 61 to reduce impacts on occupied loach minnow aquatic habitat and improve water quality
- Decommission approximately 121 miles of closed roads to improve watershed condition and reduce wildlife habitat fragmentation
    - Approximately 60 miles would be decommissioned after completion of proposed vegetation treatments
- Decommission all user routes within the planning area
- Closed roads may be temporarily opened for motor vehicle use for Administrative Use Only to provide access to proposed project implementation sites. Roads will revert to closed status after completion of work.
- Temporary roads would be constructed in some treatment units. Lengths would vary from 0.2 to 0.5 miles in length. Estimated 3-5 miles of temporary roads may be constructed to access into vegetation treatment units to minimize skidding distances. Temporary roads would be obliterated after completion of vegetation treatments.
- The use of motor vehicles off of Forest system roads and trails would be authorized where needed and where appropriate for Forest Service or Forest Service contractors to implement proposed treatments. Also, areas identified for fire wood or other forest product collection by permit, public access using motor vehicles off of Forest system roads would be authorized as needed and where appropriate.
- Re-open 1.7 miles of closed roads to open to all motorized vehicles as ML2 roads
- Open and convert approximately 13 miles of maintenance level 1 closed roads to NFS trails and designate for ATVs (motorized vehicles less than 50 inches in width)
- Add approximately 4 miles of user created routes to NFS trails and designate for ATVs (motorized vehicle less than 40 inches in width)
- Construct approximately 0.3 miles of ATV trail (motorized vehicles less than 50 inches in width) to connect with other systems of motorized routes and to avoid sensitive aquatic resources in Dillman Creek

Forest Plan Amendments

Amend the Forest Plan at the project level. These include:

- Allow a one-time project specific amendment to the Forest Plan to allow the Forest to deviate from Forest Plan standard and guidelines Management Areas 3B, 3C, and 3D to exceed the acres per decade for the amount of activity fuels treated (10,000; 4,000, 12,000 respectively) and fuels treated with prescribed fire (10,000; 3,000; 10,000 respectively).
- Allow a one-time project specific amendment to the Forest Plan to allow the Forest to deviate from Forest Plan standard and guidelines in Management Area 3D to exceed the amount of wildlife habitat development numbers (Wetland developments-8 structures; Brush pile development-10 structures; Prescribed burns-1,000 acres; Planting browse/riparian-10 acres; Control of habitat access-10 miles).
- Allow a one-time project specific amendment for Mexican Spotted Owl nest/roost conditions within mixed-conifer and pine-oak forests by replacing the 1995 MSO Recovery Plan Forest Plan page 29b restricted area table with 2012 MSO Recovery Plan First Revision; Table C.3., page 278 (Table 8).

Implementation

Implementation is estimated to begin in late 2017 or 2018 for 10 to 20 years and would occur as funding and/or favorable conditions allow.

Table 8. Table C.3., from 2012 MSO Recovery Plan, modified to show Ecological Management Units associated with the planning area. "Minimum desired conditions for mixed-conifer and pine-oak forest areas managed for Recovery nesting/roosting habitat…Parameter values are based on averages among plots sampled within forest lands." (2012 MSO Recovery Plan Table C.3., page 278)

Ecological Management Unit - Forest Type	% of area[1]	% Basal Area Size Class of 30-46 cm dbh (12-18")	% Basal Area Size Class of >46 cm dbh (>18")	Minimum tree Basal Area[2]	Minimum density of large trees[3]
Upper Gila Mountain - Mixed-conifer	25	>30	>30	27.5 (120)	30 (12)
Upper Gila Mountain – Pine-oak	10	>30	>30	25.3 (110)	30 (12)

1. % of area pertains to the percent of the planning area, subregion, and/or region in the specified forest type that should be managed for threshold conditions.
2. BAs in m2/ha (ft2/acre), and include all trees >1 inch dbh (i.e., any species). Values shown are **minimums**, not targets.
3. Trees > 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets.